WHAT IS CLAIMED IS:

Sub a1

1. A coordinate input apparatus for inputting three-dimensional coordinates, comprising:

designation means, having a light emission device, for designating a three-dimensional position;

a plurality of line sensors for receiving light emitted by the light emission device and determining a three-dimensional position where the light emission device exists; and

calculation means for calculating three-dimensional coordinates of a position where said designation means exists, based on a determined value obtained by said plurality of line sensors.

Sub C1

2. The coordinate input apparatus according to claim 1, wherein said plurality of line sensors comprise:

a line sensor arranged in a first direction; and

a line sensor arranged in a second direction which is perpendicular to the first direction,

wherein at least one of the first or second direction includes a plurality of line sensors.

3. The coordinate input apparatus according to claim 1, wherein the light emission device emits light

in a predetermined cycle, each of said plurality of line sensors comprises an electronic shutter function, and the electronic shutter function is turned on and off with a phase synchronous with the light emission cycle of the light emission device or a cycle which is an integral multiple of the light emission cycle.

4. The coordinate input apparatus according to claim 1, wherein said calculation means calculates relative three-dimensional coordinates of said designation means with respect to the plurality of line sensors, based on a plurality of two-dimensional data and difference between the two-dimensional data determined by said plurality of line sensors.

5. The coordinate input apparatus according to claim 3, wherein each of said plurality of line sensors is a ring-type CCD comprising a cyclical charge transfer path constructed with a plurality of cells,

wherein each charge is simultaneously transferred from arbitrary photoelectric transducers arranged in line to the cyclical charge transfer path and circulated in the cyclical charge transfer path in a cycle synchronous with turning on and off the electronic shutter function, and each time the charge circulates once, new charge is added from the same photoelectric

transducer and accumulated.

6. The coordinate input apparatus according to claim 5, wherein in each of said plurality of line sensors, a signal reader is connected to a cell of the cyclical charge transfer path, and outputs a voltage proportional to a charge passing the cell to an external unit.

7. The coordinate input apparatus according to claim 5, wherein the electronic shutter function is turned on at each timing of light-on and light-off of the light emission device, and transfers charges accumulated at each timing to an adjacent cell in the cyclical charge transfer path.

8. The coordinate input apparatus according to claim 6, wherein the signal reader reads out a voltage proportional to a difference between charges of two adjacent cells.

9. The coordinate input apparatus according to claim 5, wherein in said plurality of line sensors, a control for circulating a charge while accumulating charges by turning on and off the electronic shutter function, and a control for circulating a charge while

halting the accumulation of charges by turning off the electronic shutter function, are executed by an external unit.

10. The coordinate input apparatus according to claim 3, further comprising a photoreception device for synchronizing light emission of the light emission device with the electronic shutter function.

11. A control method of a coordinate input apparatus for inputting three-dimensional coordinates, comprising the steps of:

inputting a three-dimensional position of a light emission device based on light emission of the light emission device;

determining the three-dimensional position where the light emission device exists based on light emitted by the light emission device and received by a plurality of line sensors; and

calculating three-dimensional coordinates of the position where the light emission device exists, based on a determined value obtained in said determining step.

12. The control method of a coordinate input apparatus according to claim 11, wherein said plurality of line sensors comprise:

a line sensor arranged in a first direction; and

a line sensor arranged in a second direction which is perpendicular to the first direction,

wherein at least one of the first or second direction includes a plurality of line sensors.

13. The control method of a coordinate input apparatus according to claim 11, wherein the light emission device emits light in a predetermined cycle, each of said plurality of line sensors comprises an electronic shutter function, and the electronic shutter function is turned on and off with a phase synchronous with the light emission cycle of the light emission device or a cycle which is an integral multiple of the light emission cycle.

14. The control method of a coordinate input apparatus according to claim 11, wherein in said calculation step, relative three-dimensional coordinates of the light emission device with respect to the plurality of line sensors are calculated based on a plurality of two-dimensional data and difference between the two-dimensional data determined by said plurality of line sensors.

15. The control method of a coordinate input

apparatus according to claim 13, wherein each of said plurality of line sensors is a ring-type CCD comprising a cyclical charge transfer path constructed with a plurality of cells,

wherein each charge is simultaneously transferred from arbitrary photoelectric transducers arranged in line to the cyclical charge transfer path and circulated in the cyclical charge transfer path in a cycle synchronous with turning on and off the electronic shutter function, and each time the charge circulates once, new charge is added from the same photoelectric transducer and accumulated.

16. The control method of a coordinate input apparatus according to claim 15, wherein in each of said plurality of line sensors, a signal reader is connected to a cell of the cyclical charge transfer path, and outputs a voltage proportional to a charge passing the cell to an external unit.

17. The control method of a coordinate input apparatus according to claim 15, wherein the electronic shutter function is turned on at each timing of light-on and light-off of the light emission device, and transfers charges accumulated at each timing to an adjacent cell in the cyclical charge transfer path.

18. The control method of a coordinate input apparatus according to claim 16, wherein the signal reader reads out a voltage proportional to a difference between charges of two adjacent cells.

19. The control method of a coordinate input apparatus according to claim 15, wherein in said plurality of line sensors, a control for circulating a charge while accumulating charges by turning on and off the electronic shutter function, and a control for circulating a charge while halting the accumulation of charges by turning off the electronic shutter function, are executed by an external unit.

20. The control method of a coordinate input apparatus according to claim 13, further comprising a step of synchronizing light emission of the light emission device with the electronic shutter function by using a photoreception device.

Sub A3

21. A computer-readable memory storing program codes for controlling a coordinate input apparatus which inputs three-dimensional coordinates, said memory comprising:

program codes for an input step of inputting a

three-dimensional position of a light emission device based on light emission of the light emission device;

program codes for a determining step of determining the three-dimensional position where the light emission device exists based on light emitted by the light emission device and received by a plurality of line sensors; and

program codes for a calculation step of calculating three-dimensional coordinates of the position where the light emission device exists, based on a determined value obtained in said determining step.

22. A coordinate input apparatus for inputting three-dimensional coordinates, comprising:

designation means, having a light emission device, for designating a three-dimensional position;

a plurality of line sensors for receiving light emitted by the light emission device and determining a three-dimensional position where the light emission device exists;

a photoreception device for receiving light emitted by the light emission device;

calculation means for calculating three-dimensional coordinates of a position where said designation means exists, based on a determined value obtained by said plurality of line sensors; and

synchronization means for synchronizing a light emission cycle of the light emission device with a photoreception cycle of said line sensors based on a signal outputted by said photoreception device.

23. The coordinate input apparatus according to claim 22, wherein said plurality of line sensors comprise:

a line sensor arranged in a first direction; and

a line sensor arranged in a second direction which is perpendicular to the first direction,

wherein at least one of the first or second direction includes a plurality of line sensors.

24. The coordinate input apparatus according to claim 22, wherein the light emission device emits light in a predetermined cycle, each of said plurality of line sensors comprises an electronic shutter function, and the electronic shutter function is turned on and off with a phase synchronous with the light emission cycle of the light emission device or a cycle which is an integral multiple of the light emission cycle.

25. The coordinate input apparatus according to claim 22, wherein said calculation means calculates relative three-dimensional coordinates of said

designation means with respect to the plurality of line sensors, based on a plurality of two-dimensional data and difference between the two-dimensional data determined by said plurality of line sensors.

26. The coordinate input apparatus according to claim 24, wherein each of said plurality of line sensors is a ring-type CCD comprising a cyclical charge transfer path constructed with a plurality of cells,

wherein each charge is simultaneously transferred from arbitrary photoelectric transducers arranged in line to the cyclical charge transfer path and circulated in the cyclical charge transfer path in a cycle synchronous with turning on and off the electronic shutter function, and each time the charge circulates once, new charge is added from the same photoelectric transducer and accumulated.

27. The coordinate input apparatus according to claim 26, wherein in each of said plurality of line sensors, a signal reader is connected to a cell of the cyclical charge transfer path, and outputs a voltage proportional to a charge passing the cell to an external unit.

28. The coordinate input apparatus according to

claim 26, wherein the electronic shutter function is turned on at each timing of light-on and light-off of the light emission device, and transfers charges accumulated at each timing to an adjacent cell in the cyclical charge transfer path.

29. The coordinate input apparatus according to claim 27, wherein the signal reader reads out a voltage proportional to a difference between charges of two adjacent cells.

30. The coordinate input apparatus according to claim 26, wherein in said plurality of line sensors, a control for circulating a charge while accumulating charges by turning on and off the electronic shutter function, and a control for circulating a charge while halting the accumulation of charges by turning off the electronic shutter function, are executed by an external unit.

31. The coordinate input apparatus according to claim 26, wherein in said plurality of line sensors, a number of times of accumulation of the charge is controlled in accordance with a received amount of light which has been emitted by the light emission device.

32. The coordinate input apparatus according to claim 24, wherein said designation means includes a plurality of switches,

the light emission device emits light based on one of a plurality of different modulation signals modulated by a carrier frequency higher than the predetermined cycle, and

selection from the plurality of different modulation signals is made by the plurality of switches.

33. The coordinate input apparatus according to claim 32, wherein said synchronization means comprises generation means for generating a group of signals representing auxiliary data, indicative of time axis data of a signal from the light emission device and switch data for the plurality of switches of said designation means, based on a signal obtained by inputting a signal from the photoreception device to a band-pass filter having the same frequency characteristic as the carrier frequency, and

based on the group of signals generated by the generation means, the light emission cycle of the light emission device and the photoreception cycle of said plurality of line sensors are synchronized.

34. The coordinate input apparatus according to

claim 33, wherein said synchronization means executes a timing sequence, serving as a control signal of said plurality of line sensors, by referring to an arbitrary light-on timing of the light emission device obtained by the group of signals, and repeats the timing sequence each time coordinate data for a point is processed.

35. A control method of a coordinate input apparatus for inputting three-dimensional coordinates, comprising the steps of:

receiving light, emitted by a designation device having a light emission device, with a plurality of line sensors and determining a three-dimensional position where the light emission device exists;

receiving light, emitted by the light emission device, with a photoreception device;

calculating three-dimensional coordinates of a position where the light emission device exists, based on a determined value obtained in said determining step;

synchronizing a light emission cycle of the light emission device with a photoreception cycle of the line sensors based on a signal outputted by the photoreception device.

36. The control method of a coordinate input apparatus according to claim 35, wherein said plurality

of line sensors comprise:

a line sensor arranged in a first direction; and

a line sensor arranged in a second direction which is perpendicular to the first direction,

wherein at least one of the first or second direction includes a plurality of line sensors.

37. The control method of a coordinate input apparatus according to claim 35, wherein the light emission device emits light in a predetermined cycle, each of said plurality of line sensors comprises an electronic shutter function, and the electronic shutter function is turned on and off with a phase synchronous with the light emission cycle of the light emission device or a cycle which is an integral multiple of the light emission cycle.

38. The control method of a coordinate input apparatus according to claim 35, wherein in said calculation step, relative three-dimensional coordinates of the light emission device with respect to the plurality of line sensors are calculated based on a plurality of two-dimensional data and difference between the two-dimensional data determined in said determining step.

39. The control method of a coordinate input apparatus according to claim 37, wherein each of said plurality of line sensors is a ring-type CCD comprising a cyclical charge transfer path constructed with a plurality of cells,

wherein each charge is simultaneously transferred from arbitrary photoelectric transducers arranged in line to the cyclical charge transfer path and circulated in the cyclical charge transfer path in a cycle synchronous with turning on and off the electronic shutter function, and each time the charge circulates once, new charge is added from the same photoelectric transducer and accumulated.

40. The control method of a coordinate input apparatus according to claim 39, wherein in each of said plurality of line sensors, a signal reader is connected to a cell of the cyclical charge transfer path, and outputs a voltage proportional to a charge passing the cell to an external unit.

41. The control method of a coordinate input apparatus according to claim 39, wherein the electronic shutter function is turned on at each timing of light-on and light-off of the light emission device, and transfers charges accumulated at each timing to an

adjacent cell in the cyclical charge transfer path.

42. The control method of a coordinate input apparatus according to claim 40, wherein the signal reader reads out a voltage proportional to a difference between charges of two adjacent cells.

43. The control method of a coordinate input apparatus according to claim 39, wherein in said plurality of line sensors, a control for circulating a charge while accumulating charges by turning on and off the electronic shutter function, and a control for circulating a charge while halting the accumulation of charges by turning off the electronic shutter function, are executed by an external unit.

44. The control method of a coordinate input apparatus according to claim 39, wherein in the plurality of line sensors, a number of times of accumulation of the charge is controlled in accordance with a received amount of light which has been emitted by the light emission device.

45. The control method of a coordinate input apparatus according to claim 37, wherein said designation device includes a plurality of switches,

the light emission device emits light based on one of a plurality of different modulation signals modulated by a carrier frequency higher than the predetermined cycle, and

selection from the plurality of different modulation signals is made by the plurality of switches.

46. The control method of a coordinate input apparatus according to claim 45, wherein said synchronizing step comprises a step of generating a group of signals representing auxiliary data, indicative of time axis data of a signal from the light emission device and switch data for the plurality of switches, based on a signal obtained by inputting a signal from the photoreception device to a band-pass filter having the same frequency characteristic as the carrier frequency, and

based on the group of signals generated in the generation step, the light emission cycle of the light emission device and the photoreception cycle of the plurality of line sensors are synchronized.

47. The control method of a coordinate input apparatus according to claim 46, wherein in said synchronizing step, a timing sequence, serving as a control signal of said plurality of line sensors, is

executed by referring to an arbitrary light-on timing of the light emission device obtained by the group of signals, and the timing sequence is repeated each time coordinate data for a point is processed.

Sub A5

48. A computer-readable memory storing program codes for controlling a coordinate input apparatus which inputs three-dimensional coordinates, said memory comprising:

program codes for a determining step of receiving light, emitted by a designation device having a light emission device, with a plurality of line sensors and determining a three-dimensional position where the light emission device exists;

program codes for a photoreception step of receiving light, emitted by the light emission device, with a photoreception device;

program codes for a calculation step of calculating three-dimensional coordinates of a position where the light emission device exists, based on a determined value obtained in said determining step;

program codes for a synchronizing step of synchronizing a light emission cycle of the light emission device with a photoreception cycle of the line sensors based on a signal outputted by the photoreception device.

49. A coordinate input apparatus for inputting three-dimensional coordinates, comprising:

designation means for designating a three-dimensional position, said designation means having a light emission device and a plurality of switches;

a plurality of line sensors for receiving light emitted by the light emission device and determining a three-dimensional position where the light emission device exists;

a photoreception device for receiving light emitted by the light emission device;

binarization means for binarizing an output signal of said photoreception device;

calculation means for calculating three-dimensional coordinates of a position where said designation means exists based on a binarized signal outputted by said binarization means and a determined value obtained by said plurality of line sensors.

Sub C1

50. The coordinate input apparatus according to claim 49, wherein said binarization means comprises generation means for generating a threshold value signal for binarizing the output signal,

wherein a level of the threshold value signal generated by said generation means is formed by a sum of

a first signal, a second signal, and a third signal.

51. The coordinate input apparatus according to claim 50, wherein the first signal is generated by inputting the output signal of said photoreception device to a low-pass filter, a delay circuit, and a damping circuit.

52. The coordinate input apparatus according to claim 50, wherein the second signal is a constant signal generated based on a DC voltage.

53. The coordinate input apparatus according to claim 50, wherein the third signal is generated by inputting the binarized signal, outputted by said binarization means, to a NOT circuit and a damping circuit.

54. The coordinate input apparatus according to claim 49, wherein said plurality of line sensors comprise:

a line sensor arranged in a first direction; and

a line sensor arranged in a second direction which is perpendicular to the first direction,

wherein at least one of the first or second direction includes a plurality of line sensors.

55. The coordinate input apparatus according to claim 49, wherein the light emission device emits light in a predetermined cycle, each of said plurality of line sensors comprises an electronic shutter function, and the electronic shutter function is turned on and off with a phase synchronous with the light emission cycle of the light emission device or a cycle which is an integral multiple of the light emission cycle.

56. The coordinate input apparatus according to claim 49, wherein said calculation means calculates relative three-dimensional coordinates of said designation means with respect to the plurality of line sensors, based on a plurality of two-dimensional data and difference between the two-dimensional data determined by said plurality of line sensors.

57. The coordinate input apparatus according to claim 55, wherein each of said plurality of line sensors is a ring-type CCD comprising a cyclical charge transfer path constructed with a plurality of cells,

wherein each charge is simultaneously transferred from arbitrary photoelectric transducers arranged in line to the cyclical charge transfer path and circulated in the cyclical charge transfer path in a cycle

synchronous with turning on and off the electronic shutter function, and each time the charge circulates once, new charge is added from the same photoelectric transducer and accumulated.

58. The coordinate input apparatus according to claim 57, wherein in each of said plurality of line sensors, a signal reader is connected to a cell of the cyclical charge transfer path, and outputs a voltage proportional to a charge passing the cell to an external unit.

59. The coordinate input apparatus according to claim 57, wherein the electronic shutter function is turned on at each timing of light-on and light-off of the light emission device, and transfers charges accumulated at each timing to an adjacent cell in the cyclical charge transfer path.

60. The coordinate input apparatus according to claim 58, wherein the signal reader reads out a voltage proportional to a difference between charges of two adjacent cells.

61. The coordinate input apparatus according to claim 57, wherein in said plurality of line sensors, a

control for circulating a charge while accumulating charges by turning on and off the electronic shutter function, and a control for circulating a charge while halting the accumulation of charges by turning off the electronic shutter function, are executed by an external unit.

62. The coordinate input apparatus according to claim 57, wherein in said plurality of line sensors, a number of times of accumulation of the charge is controlled in accordance with a received amount of light which has been emitted by the light emission device.

Sub d6

63. The coordinate input apparatus according to claim 55, wherein the light emission device emits light based on one of a plurality of different modulation signals modulated by a carrier frequency higher than the predetermined cycle, and

selection from the plurality of different modulation signals is made by the plurality of switches.

64. A control method of a coordinate input apparatus for inputting three-dimensional coordinates, comprising the steps of:

determining a three-dimensional position where a light emission device exists by receiving light, emitted

by a designation device having the light emission device and a plurality of switches, with a plurality of line sensors;

receiving light, emitted by the light emission device, with a photoreception device;

binarizing an output signal of the photoreception device; and

calculating three-dimensional coordinates of a position of the designation device based on a binarized signal outputted in said binarization step and a determined value obtained by the plurality of line sensors.

Sub C1

65. The control method of a coordinate input apparatus according to claim 64, wherein said binarization step comprises a generation step of generating a threshold value signal for binarizing the output signal,

wherein a level of the threshold value signal generated in said generation step is formed by a sum of a first signal, a second signal, and a third signal.

66. The control method of a coordinate input apparatus according to claim 65, wherein the first signal is generated by inputting the output signal of the photoreception device to a low-pass filter, a delay

circuit, and a damping circuit.

67. The control method of a coordinate input apparatus according to claim 65, wherein the second signal is a constant signal generated based on a DC voltage.

68. The control method of a coordinate input apparatus according to claim 65, wherein the third signal is generated by inputting the binarized signal, outputted in said binarization step, to a NOT circuit and a damping circuit.

69. The control method of a coordinate input apparatus according to claim 64, wherein said plurality of line sensors comprise:

a line sensor arranged in a first direction; and

a line sensor arranged in a second direction which is perpendicular to the first direction,

wherein at least one of the first or second direction includes a plurality of line sensors.

70. The control method of a coordinate input apparatus according to claim 64, wherein the light emission device emits light in a predetermined cycle, each of said plurality of line sensors comprises an

electronic shutter function, and the electronic shutter function is turned on and off with a phase synchronous with the light emission cycle of the light emission device or a cycle which is an integral multiple of the light emission cycle.

71. The control method of a coordinate input apparatus according to claim 64, wherein in said calculation step, relative three-dimensional coordinates of the designation device with respect to the plurality of line sensors are calculated based on a plurality of two-dimensional data and difference between the two-dimensional data determined by said plurality of line sensors.

72. The control method of a coordinate input apparatus according to claim 70, wherein each of said plurality of line sensors is a ring-type CCD comprising a cyclical charge transfer path constructed with a plurality of cells,

wherein each charge is simultaneously transferred from arbitrary photoelectric transducers arranged in line to the cyclical charge transfer path and circulated in the cyclical charge transfer path in a cycle synchronous with turning on and off the electronic shutter function, and each time the charge circulates

once, new charge is added from the same photoelectric transducer and accumulated.

73. The control method of a coordinate input apparatus according to claim 72, wherein in each of said plurality of line sensors, a signal reader is connected to a cell of the cyclical charge transfer path, and outputs a voltage proportional to a charge passing the cell to an external unit.

74. The control method of a coordinate input apparatus according to claim 72, wherein the electronic shutter function is turned on at each timing of light-on and light-off of the light emission device, and transfers charges accumulated at each timing to an adjacent cell in the cyclical charge transfer path.

75. The control method of a coordinate input apparatus according to claim 73, wherein the signal reader reads out a voltage proportional to a difference between charges of two adjacent cells.

76. The control method of a coordinate input apparatus according to claim 72, wherein in said plurality of line sensors, a control for circulating a charge while accumulating charges by turning on and off

the electronic shutter function, and a control for circulating a charge while halting the accumulation of charges by turning off the electronic shutter function, are executed by an external unit.

77. The control method of a coordinate input apparatus according to claim 72, wherein in the plurality of line sensors, a number of times of accumulation of the charge is controlled in accordance with a received amount of light which has been emitted by the light emission device.

78. The control method of a coordinate input apparatus according to claim 70, wherein the light emission device emits light based on one of a plurality of different modulation signals modulated by a carrier frequency higher than the predetermined cycle, and

selection from the plurality of different modulation signals is made by the plurality of switches.

Sub a7

79. A computer-readable memory storing program codes for controlling a coordinate input apparatus which inputs three-dimensional coordinates, said memory comprising:

program codes for a determining step of determining a three-dimensional position where a light

emission device exists by receiving light, emitted by a designation device having the light emission device and a plurality of switches, with a plurality of line sensors;

program codes for a photoreception step of receiving light, emitted by the light emission device, with a photoreception device;

program codes for binarization step of binarizing an output signal of the photoreception device; and

program codes for calculation step of calculating three-dimensional coordinates of a position of the designation device based on a binarized signal outputted in said binarization step and a determined value obtained by the plurality of line sensors.

80. A coordinate input apparatus for detecting a position of a light spot, generated on a predetermined two-dimensional coordinate surface with light emitted by a designation device which emits light in a predetermined blinking cycle, and for outputting detected coordinate data, said apparatus comprising:

a first photoreception sensor for detecting from the light spot, a light emission position in two-dimensional direction;

a second photoreception sensor for detecting from the light spot, time series variance of light emitted;

synchronization control means for synchronizing detection operation of said first photoreception sensor with the blinking cycle of light in the light spot based on the time series variance of the light spot detected by said second photoreception sensor; and

calculation means for calculating coordinates of the position of the light spot, generated on the two-dimensional coordinate surface, based on a signal outputted from said first photoreception sensor brought to a synchronous state by said synchronization control means.

Sub C1

81. The coordinate input apparatus according to claim 80, wherein said first photoreception sensor includes two line sensors arranged in two directions which are not parallel.

82. The coordinate input apparatus according to claim 81, wherein each of the line sensors is a ring-type CCD having a photoelectric transducer and a ring-shaped charge transfer path capable of consecutively adding and accumulating a charge generated in the photoelectric transducer,

said synchronization control means controls the ring-type CCD such that the photoelectric transducer performs photoelectric conversion in synchronization

with the blinking cycle of light in the light spot, and that a charge generated by the photoelectric conversion is circulated in the charge transfer path and is consecutively added and accumulated in synchronization with the blinking cycle, and

said calculation means sequentially reads out the charge accumulated in the charge transfer path as an electric signal, and based on difference of the read electric signals, calculates coordinates of the position of the light spot generated on the two-dimensional coordinate surface.

83. The coordinate input apparatus according to claim 82, wherein said synchronization control means changes a period of adding and accumulating the charge, generated in the photoelectric transducer, in the charge transfer path in accordance with the amount of light in the light spot.

84. The coordinate input apparatus according to claim 80, wherein each time coordinate data of the light spot for a point is processed, said synchronization control means detects a light-on period start timing or end timing in the blinking cycle of light in the light spot based on the time series variance of the light spot detected by said second photoreception sensor and

synchronizes detection operation of said first photoreception sensor with a timing which has been deviated from the detected timing by a predetermined time period.

85. The coordinate input apparatus according to claim 80, wherein the designation device comprises modulation means for modulating a light-on cycle of blinking light by a carrier frequency sufficiently higher than a blinking frequency, and

said synchronization control means comprises a waveform processor which inputs an electric signal, representing the light spot detected by said second photoreception sensor, to a band-pass filter having substantially the same resonance frequency characteristic as the carrier frequency, to extract only a frequency component substantially the same as the carrier frequency included in the electric signal.

86. The coordinate input apparatus according to claim 80, wherein the designation device further comprises an operation switch and modulation control means for controlling said modulation means to modulate or not modulate according to operation of the switch, and

said synchronization control means comprises

detection means for detecting an operation state of the switch by determining whether or not modulation has been performed by said modulation means based on a time series variance of the electric signal representing the light spot detected by said second photoreception sensor.

Sub a8

87. A control method of a coordinate input apparatus which detects a position of a light spot, generated on a predetermined two-dimensional coordinate surface with light emitted by a designation device which emits light in a predetermined blinking cycle, and outputs detected coordinate data, said method comprising:

a first detection step of detecting from the light spot, a light emission position in two-dimensional direction, by using a first photoreception sensor;

a second detection step of detecting from the light spot, time series variance of light emitted, by using a second photoreception sensor;

a synchronization control step of synchronizing detection operation of the first photoreception sensor with the blinking cycle of light in the light spot based on the time series variance of the light spot detected by the second photoreception sensor; and

a calculation step of calculating coordinates of the position of the light spot, generated on the two-

dimensional coordinate surface, based on a signal outputted from the first photoreception sensor brought to a synchronous state in said synchronization control step.

Sub C1

88. The control method of the coordinate input apparatus according to claim 87, wherein the first photoreception sensor includes two line sensors arranged in two directions which are not parallel.

89. The control method of the coordinate input apparatus according to claim 88, wherein each of the line sensors is a ring-type CCD having a photoelectric transducer and a ring-shaped charge transfer path capable of consecutively adding and accumulating a charge generated in the photoelectric transducer,

in said synchronization control step, the ring-type CCD is controlled such that the photoelectric transducer performs photoelectric conversion in synchronization with the blinking cycle of light in the light spot, and that a charge generated by the photoelectric conversion is circulated in the charge transfer path and is consecutively added and accumulated in synchronization with the blinking cycle, and

in said calculation step, the charge accumulated in the charge transfer path is sequentially read out as

an electric signal, and based on difference of the read electric signals, coordinates of the position of the light spot generated on the two-dimensional coordinate surface are calculated.

90. The control method of the coordinate input apparatus according to claim 89, wherein in said synchronization control step, a period of adding and accumulating the charge, generated in the photoelectric transducer, in the charge transfer path is changed in accordance with the amount of light in the light spot.

91. The control method of the coordinate input apparatus according to claim 87, wherein in said synchronization control step, each time coordinate data of the light spot for a point is processed, a light-on period start timing or end timing in the blinking cycle of light in the light spot is detected based on the time series variance of the light spot detected by the second photoreception sensor and detection operation of the first photoreception sensor is synchronized with a timing which has been deviated from the detected timing by a predetermined time period.

92. The control method of the coordinate input apparatus according to claim 87, wherein the designation

device comprises a modulator for modulating a light-on cycle of blinking light by a carrier frequency sufficiently higher than a blinking frequency, and

said synchronization control step comprises a waveform processing step of inputting an electric signal, representing the light spot detected by the second photoreception sensor, to a band-pass filter having substantially the same resonance frequency characteristic as the carrier frequency, to extract only a frequency component substantially the same as the carrier frequency included in the electric signal.

93. The control method of the coordinate input apparatus according to claim 87, wherein the designation device further comprises an operation switch and a modulation controller for controlling the modulator to modulate or not modulate according to operation of the switch, and

said synchronization control step comprises a detection step of detecting an operation state of the switch by determining whether or not modulation has been performed by the modulator based on a time series variance of the electric signal representing the light spot detected by the second photoreception sensor.

Sub a9

94. A computer-readable memory storing program

codes for controlling a coordinate input apparatus which detects a position of a light spot, generated on a predetermined two-dimensional coordinate surface with light emitted by a designation device which emits light in a predetermined blinking cycle, and outputs detected coordinate data, said memory comprising:

program codes for a first detection step of detecting from the light spot, a light emission position in two-dimensional direction, by using a first photoreception sensor;

program codes for a second detection step of detecting from the light spot, time series variance of light emitted, by using a second photoreception sensor;

program codes for a synchronization control step of synchronizing detection operation of the first photoreception sensor with the blinking cycle of light in the light spot based on the time series variance of the light spot detected by the second photoreception sensor; and

program codes for a calculation step of calculating coordinates of the position of the light spot, generated on the two-dimensional coordinate surface, based on a signal outputted from the first photoreception sensor brought to a synchronous state in said synchronization control step.